UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
CHEMICAL SAFETY AND
POLLUTION PREVENTION

**MEMORANDUM**:

**To**: Maggie Rudick

**From**: Eric Bohnenblust, Ph.D., Entomologist

**Secondary Review:** Kevin Sweeney, Senior Entomologist

**Date**: July 7, 2015

**Subject**: PRODUCT PERFORMANCE DATA EVALUATION RECORD (DER)

**THIS DER DOES NOT CONTAIN CONFIDENTIAL BUSINESS INFORMATION**

**Note:** MRIDs found to be **unacceptable** to support label claims should be removed from the data matrix.

**DP barcode:** 426477
**Decision no.:** 499128
**Submission no:** 962823
**Action code:** R310
**Product Name:** Ortho Fire Ant Killer 2681
**EPA Reg. No or File Symbol:** 239-ETET
**Formulation Type:** spreadable granular formulation
**Ingredients statement from the label with PC codes included:**
Bifenthrin 0.2% PC: 128825
**Application rate(s) of product and each active ingredient (lbs. or gallons/1000 square feet or per acre as appropriate; and g/m$^2$ or mg/cm$^2$ or mg/kg body weight as appropriate):**
0.2 lb bifenthrin/acre [2.3 lb product (0.0046 lb bifenthrin)/1000 ft$^2$, 11.5 lb product (0.023 lb bifenthrin)/5000 ft$^2$, 23 lb product (0.046 lb bifenthrin)/10000 ft$^2$]
**Use Patterns:** Ant mound treatment, outdoor broadcast application

**I. Action Requested:** The registrant is requesting review of 13 MRIDs to support efficacy claims against fire ants, and harvester ants. Specifically, the registrant is requesting re-review of MRID 48387402 with regard to speed to kill claims.

**II. Background:** The registrant cited 12 MRIDs and submitted 1 new MRID to support residual and speed to kill efficacy claims against fire ants. The registrant also is proposing efficacy claims against ant mounds and queens and harvester ants. The 12 cited MRIDs have been reviewed for other products, and short summaries of previous reviews are presented below. In addition, MRID 48387402 was reviewed to determine whether it supports speed to kill claims. Reviewer contacted the registrant regarding the intended label application rate because it was not specified on the label and the registrant responded that the intended application rate is 0.2 lb bifenthrin/acre.

**III. MRID Summary: (primary review is attached)**

**(A). Previously Reviewed MRIDs:**
**46180801. Length of Red imported Fire Ant Control using Bifenthrin as Broadcast Treatment at 0.2 lb. AI/A**

**and Mound Treatment for Control of RIFA, EPA Reg. No. 239-2681.**

(1) **Conclusion: Acceptable.** The experiments in this study tested a broadcast application of granular bifenthrin at 0.2 lb a.i./acre against imported fire ant and demonstrated 95% control for up to 6 months.

**44021901. Efficacy of Broadcast Applications of Bifenthrin Granular Formulations for Imported Fire Ant Control in Turfgrass and Electrical Transformers.**

(1) **Conclusion: Supplemental.** One experiment tested a field application of granular applied bifenthrin at 0.125 lb a.i./acre against imported fire ant alate queens and demonstrated effective control for up to 4 months. The other tests used 0.25 lb bifenthrin/acre as the lowest application rate, because this rate is higher than the recommended label rate of 0.2 lb bifenthrin/acre these studies do not support efficacy claims for the proposed product.

**44137401. Efficacy of Broadcast Applications of Bifenthrin Liquid and Granular Formulations for Deer Tick (*Ixode*s sp.) Control in Turfgrass.**

(1) **Conclusion: Acceptable.** This study tested a bifenthrin rate of 0.2 lb per acre and found acceptable levels of control against deer ticks; however, residual claims are not acceptable. This study shows acceptable efficacy against deer ticks of a granular bifenthrin treatment at a rate of 0.2 lb bifenthrin/acre; however, data showing efficacy against deer ticks, dog ticks, and lone star ticks are necessary for any tick claims.

**44137402. Efficacy of Broadcast Applications of Bifenthrin Liquid and Granular Formulations for American Dog Tick (*Dermacentor variabilis*) Control in Turfgrass.**

(1) **Conclusion: Acceptable.** This study tested a bifenthrin rate of 0.2 lb per acre and found acceptable levels of control against American dog ticks; however, residual claims are not acceptable. This study shows acceptable efficacy of a granular bifenthrin treatment at 0.2 lb bifenthrin/acre against American dog ticks. However, data showing efficacy against deer ticks, dog ticks, and lone star ticks are necessary for any tick claims.

**44891902. Efficacy of Broadcast Applications of Bifenthrin Liquid and Granular Formulations to Turfgrass for Cat Flea Larval and Adult control.**

(1) **Conclusion: Unacceptable.** This study tested a bifenthrin rate of 0.2 lb per acre and found acceptable levels of control against both cat flea adults for 3 days and larvae for 7 days. However, this study does not support efficacy claims because moribund and dead insects were not separated.

**46809101. Length of Red Imported Fire Ant (Solenopsis invicta) Control Using Ortho Fire Ant Killer Granules (EPA Reg. No. 239-2681).**

(1) **Conclusion: Acceptable.** This study tested a bifenthrin rate of 0.2 lb per acre and found greater than 90% control of fire ants through 5 months post application. Control of fire ants dropped to 85% at 6 months post application. This study supports residual efficacy claims against fire ants for up to 5 months.

**46809102**. **Suppression of Red Imported Fire Ants (Solenopsis invicta) Using Ortho Fire Ant Killer Granules (EPA Reg. No. 239-1681).**

(1) **Conclusion: Acceptable.** This study tested a bifenthrin rate of 0.2 lb per acre and found greater than 90% efficacy against fire ants through 28 days post application. This study supports residual efficacy claims against fire ants for up to 28 days.

**46186401**. **Efficacy of FMC 54800 Granular Formulations for Control of Scorpions and Chiggers.**

(1) **Conclusion: Unacceptable.** This study tested the efficacy of granular bifenthrin against scorpions at a rate of 0.4 lb bifenthrin/acre. The rate tested for scorpions is higher than the labeled rate of 0.2 lb. bifenthrin/acre on the

proposed label; therefore, claims against scorpions are not acceptable. The study also tested against chiggers, the efficacy of rates of 0.1 and 0.2 lb bifenthrin/acre with and without fertilizer. Efficacy against chiggers was less than 90% for all treatments at 3 days post exposure, and was only over 90% at 10 days post exposure for the 0.2 lb bifenthrin/acre without fertilizer treatment. Because efficacy was below 90% for all but one measurement point at one rate the data do not support efficacy claims against chiggers.

**46508101**. **Efficacy of FMC 54800 Granular Pesticide for Control of Scorpions.**

(1) **Conclusion: Acceptable.** Within 4 hours of exposure 95% of scorpions exposed to bifenthrin treated soil died. This study supports kills claims for scorpions at a rate of 0.2 lb bifenthrin/acre.

**48387401. DG-Lite a Rapid Release Granule Technology.**

(1) **Conclusion: Supplemental.** A laboratory study was conducted to demonstrate the physical attributes of Dolomitic limestone pellets compared to peanut hulls when exposed to moisture. The study is supplemental information, showing that the DG-lite granule dissolves faster than peanut hulls.

**48387402. Speed of Fire Ant Control with a Granule Formulation Containing 0.05% zeta-cypermethrin and 0.20% Bifenthrin.**

(1) **Conclusion: Acceptable.** The study is acceptable to support 15 minute killing claims against fire ants for applications of ½ cup product (0.2% granular bifenthrin) directly onto ant mounds and a 3 ft. radius around the mound when mounds are drenched with 2 gallons of water. This study does not support speed of kill claims for broadcast applications.

**45298601.Efficacy of Broadcast Applications of Bifenthrin Granular Formulations for Insect Control in Turfgrass.**

(1) This MRID is a compliation of numerous studies against numerous pests. Two studies are relevant to this proposed product, one testing the efficacy of granular bifenthrin against argentine ants, and another study testing the efficacy of granular bifenthrin against pharoah ants.

(2) **Conclusion: Unacceptable.** Efficacy of a 0.2 lb bifenthrin/acre rate of a 0.2% granular bifenthrin product against argentine ants was less than 75%, and methods for this study were not presented. While the number of pharoah ants captured in petri dishes baited with corn syrup were reduced by 100% for up to 8 days post treatment at a rate of 0.2 lb bifenthrin/acre rate using a 0.2% granular bifenthrin product, this study is not acceptable because replication is not given, there is no confirmed kill, and it is not clear if petri dish traps were placed in the treatments during the same four hour period (e.g., 12:00 – 4:00 PM) on all sample days.

**(B). Newly submitted MRID:**

**49546203. Speed of Fire Ant Control with a Granule Formulation Containing 0.20% Bifenthrin.**

(1) non-GLP

(2) **Methods:** Thirty fire ant mounds were treated with a ½ cup (95 g) of a 0.2% granular bifenthrin product and another 30 mounds were treated with an unknown amount of DG Lite carrier applied directly to the mounds. There were 10 untreated mounds. After application, 2 gallons of water was applied to each mound using enough force to break the mound. Efficacy was assessed using a 1 to 5 rating scale at 1, 2, 3, 4, 5, 10, 15, 20, and 30 minutes and 40 days post application. (Note: This MRID also contains a study from 2010 which was previously submitted as MRID 48387402. The 2010 study is addressed separately under MRID 48387402 above.)

(3) **Results:** Efficacy of the bifenthrin treatment was statistically different from the control and DG Lite carrier treatments at all evaluation times beginning with the 1 minute evaluation. However, 90% mortality was not reached until 15 minutes post application. The bifenthrin treatment killed 100% of treated mounds at 40 days post

application.

(4) **Conclusion:** The study is acceptable to support claims of starts killing in minutes and 15 minute killing claims against fire ants for applications of ½ cup of a 0.2% granular bifenthrin product directly onto ant mounds and a 3 ft. radius around the mound when mounds are drenched with 2 gallons of water. This study does not support speed of kill claims for broadcast applications.

**IV. EXECUTIVE DATA SUMMARY:**

(A) The submitted data support kill claims and residual kill claims against fire ants for up to 6 months when applying a broadcast application at a rate of 0.2 lb granular bifenthrin/acre. The data also support claims against fire ants of "Kills in 15 minutes" when applying a mound treatment at a rate of 0.5 cups of product (0.2% granular bifenthrin product) to the mound and a 3 ft radius around the mound and subsequently drenching the mound with 2 gallons of water. In addition, the submitted data support a claim of kills scorpions when applying a broadcast application at a rate of 0.2 lb bifenthrin/acre.

(B) The data do not support speed of kill claims against fire ants for broadcast applications, kill claims against fleas, or any tick claims. The data do show acceptable efficacy against deer ticks and American dog ticks, but data showing efficacy against lone star ticks in addition to deer ticks and dog ticks are necessary for any tick claims.

**V. LABEL RECOMMENDATIONS:**
(1)The following changes should be made to the Directions for Use:

In the tables where there are instructions for mound treatments (Pages 2 and 4), the directions should specify to drench the mounds with 2 gallons of water.

Also on page 2 in the mound treatment section of the table, the first sentence should read: Apply ½ cup of Ortho Fire Ant Killer 2681 [product name] over each fire ant mound and a 3 ft. radius around the mound.

The product is packaged in 1 - 12 lb bags and a 23 lb bag. To achieve a rate of 0.2 lb bifenthrin/acre, 1 lb treats 435 $ft^2$. In the tables under the Directions for Use the wording should be changed from "treats up to 5000 $ft^2$" to the following depending on bag size:
1 lb treats up to 435 $ft^2$
2 lb treats up to 870 $ft^2$
3 lb treats up to 1305 $ft^2$
4 lb treats up to 1740 $ft^2$
5 lb treats up to 2175 $ft^2$
6 lb treats up to 2610 $ft^2$
7 lb treats up to 3045 $ft^2$
8 lb treats up to 3480 $ft^2$
9 lb treats up to 3915 $ft^2$
10 lb treats up to 4350 $ft^2$
11 lb treats up to 4785 $ft^2$
12 lb treats up to 5220 $ft^2$
23 lb treats up to 10000 $ft^2$

(2) The following marketing claims are acceptable:
Mound treatment starts killing fire ants in 1 minute
Mound treatment starts killing fire ants in minutes
Mound treatment kills fire ants in 15 minutes
Kills mounds and the queen
Provides 6 month fire ant control
Keeps new mounds from forming
Controls fire ant mound formation
Kills foraging fire ants

Prevents new fire ant mounds from forming for up to 6 months
Kills fly-in queens
Kills fire ants and other listed* insects (other listed insects should be listed in a footnote below the claims section)
Apply in spring and fall for year round control
[1,2,3,4,5,6] month [fire] ant[l] control ([l]except pharaoh, carpenter, and harvester ants)
Protects your lawn from [fire] ants[l] for [1,2,3,4,5,6] months ([l]except pharaoh, carpenter, and harvester ants)
Mound treatment kills fire ant mounds in 15 minutes
15 minute fire ant mound control using mound treatment
A 23 lb. bag covers/treats up to 10,000 sq. ft.
Fire ant two step: Mound and (plus/+/&) broadcast
Use as a two-step method (process) against fire ants: Mound and (plus/+/&) broadcast
Protects the entire lawn from fire ants for up to 6 months

Kills the following types of ants:
Fire ants
Odorous
Pyramid
Pavement

(3) The following marketing claims are unacceptable:
Protects the entire lawn for up to 6 months
Fast acting, [long lasting] [fire ant control]
Starts killing fast/immediately
Starts to kill fast/immediately
Use as part of the fire ant 2/two-step method/process (Mound plus/+/&/and Broadcast)
Use as part of the 2/two-step method/process (Mound plus/+/&/and Broadcast)
Use mound treatment [Ortho Orthene Fire Ant Killer/alternate brand name for EPA Reg. 239-2632] as step 1/one
Use Ortho Fire Ant Killer 2681/alternate brand name as Step 2/two [of fire ant 2-step (Mound plus/+/&/and Broadcast)]

Kills the following types of ants:
Argentine
Red harvester

(4) The following MRIDs should be removed from the data matrix, as they are classified as “unacceptable” to support the product: 45298601, 46186401, 44891902

(5) Note to Reviewer: MRIDs 44137401, 44137402, and 46508101 are acceptable; however, they do not pertain to any claims on the proposed product label and should be removed from the data matrix. Note MRIDs 44137401 and 44137402 test the efficacy of granular bifenthrin against deer ticks and dog ticks. If in the future the registrant requests claims against ticks, additional data showing efficacy against lone star ticks will be required for any tick claims.

Note to PM: MRID 44891902 has been previously accepted by the Agency to support efficacy claims, but it does not meet our current criteria for efficacy studies and in addition the study is not relevant to the proposed product because there are not any proposed claims of efficacy against fleas on the label. MRID 45298601 has been previously accepted by the Agency to support efficacy claims, but it also does not meet our current criteriafor efficacy studies

## TASK 2 DATA EVALUATION RECORD

**STUDY TYPE: Product Performance**

**MRID 495462-03. Rawlings, M.R. Speed of Fire Ant Control with a Granule Formulation Containing 0.20% Bifenthrin. November 24, 2014.**

**810.3100: Soil Treatments for Imported Fire Ants**

**Product Name: Ortho Fire Ant Killer 2681**
**EPA Reg. No. or File Symbol: 239-ETET**
**Decision number: 499128**
**DP number: 426477**

Prepared for
Registration Division (7505)
Office of Pesticide Programs
U.S. Environmental Protection Agency
Washington, DC 20460

Prepared by
Summitec Corporation
Task Order No.: 2-249

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Disclaimer

This review may have been altered subsequent to the contractors' signatures above.

Summitec Corp. for the U.S. Environmental Protection Agency under Contract No. EP-W-11-014

| | |
|---|---|
| **STUDY TYPE:** | 810.3100 Soil Treatments for Imported Fire Ants |
| **MRID:** | MRID 495462-03. Rawlings, M.R. Speed of Fire Ant Control with a Granule Formulation Containing 0.20% Bifenthrin. November 24, 2014. |
| **DP BARCODE:** | 426477 |
| **DECISION NO:** | 499128 |
| **SUBMISSION NO:** | 962823 |
| **SPONSOR:** | The Scotts Company LLC<br>14111 Scottslawn Road<br>Marysville, Ohio 43041 |
| **TESTING FACILITY:** | Auburn University<br>Department of Entomology & Plant Pathology<br>301 Funchess Hall<br>Auburn, AL 36849 |
| **STUDY DIRECTOR:** | Michael Ceddia, Ph.D. |
| **SUBMITTER:** | Jane Rothwell, Sr. Analyst |
| **STUDY COMPLETED:** | 24/11/2014 |
| **CONFIDENTIALITY CLAIMS:** | None |
| **GOOD LABORATORY PRACTICE:** | "This study does not meet the requirements of 40 CFR Part 160, and differs in the following ways:<br><br>1. The study was not conducted under Good Laboratory Practice standards." |
| **TEST MATERIAL:** | PRODUCT NAME: Ortho Fire Ant Killer 2681<br>EPA REGISTRATION NUMBER OR FILE SYMBOL: 239-ETET<br>ACTIVE INGREDIENT NAME: Bifenthrin<br>CHEMICAL NAME: NA<br>A.I. %: 0.20%<br>PC CODE: Not given<br>CAS NO.: Not given<br>FORMULATION TYPE: Granules<br>PRODUCT APPLICATION RATE(S) $g/m^2$: |

| | |
|---|---|
| | Apply ½ cup of Ortho Fire Ant Killer 2681 [product name] over each fire ant mound. A 4 ft. diameter circle around the mound should also be treated. If the soil is not moist, then it is important to irrigate before application. After applying the product, drench the mounds with 1 to 2 gallons of water.<br>ACTIVE INGREDIENT APPLICATION RATE(S)g/$m^2$:<br>0.2 lb Bifenthrin/acre |
| **PROPOSED LABEL MARKETING CLAIMS:** | Controls/kills/suppresses mounds in 15 minutes; Starts killing fast/immediately |

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## STUDY REVIEW

**Purpose:** To document the speed of fire ant control in a third location with the use of 0.20% Bifenthrin granule formulation in support of previously submitted and approved data.

**MATERIALS AND METHODS**

**Test Location:** FarmLinks Research & Demonstration Golf Course in Fayetteville, AL.

**Test Material(s):** Ortho Fire Ant Killer 2681 which is the same as the labeled product. Bifenthrin 0.20%.

**Test Species Name, Life Stage, Sex and Age**: Red Imported Fire Ant, *Solenopsis invicta*

**Describe test containers, chambers and/or apparatus (include site description and location) and how experiment was conducted:** Fire ant mounds were scouted along the entrance road to the FarmLinks golf course to confirm activity 24 hours prior to treatment. Randomized complete block design was utilized. The mounds were divided into three blocks of ten within each replicate and treatments were randomly assigned to blocks within the replicate. There was only one replicate containing 10 mounds for the untreated control. Each mound was located with a GPS/GIS system for relocation.

**List the treatments including untreated control (express application rate as $g/m^2$):**
Treatments were applied to mounds in the Ortho Fire Ant Killer (standard) and to the Ortho Test Product plots on October 14, 2014. On October 15, 2014, the DG Lite 150 treatment was applied and untreated control mounds were rated. At the time of treatment, 95 grams of product (0.19 g Bifenthrin) was directly applied to the mound and an area surrounding it, up to 3 feet radius. Two gallons of water was then applied to each plot with enough force to break the top of the mound.

**Number of replicates per treatment:** 3 replicates of 10 mounds (30 mounds per treatment) and one untreated control replicate of 10 mounds.

**Number of individuals per replicate:** NA - active fire ant mounds

**Length of exposure to treatment (time in seconds, minutes or hours):** Continuous following initial treatment.

**Were tested specimens transferred to clean containers?** NA

**Experimental conditions (state relative humidity, temperature, and photoperiod):**

| Observation | Target | | Actual | | |
|---|---|---|---|---|---|
| | Before | Day of | 10/13 | 10/14 | 10/15 |
| Temperature (°F) | 70-95 | 70-95 | 80° F | 75° F | 69° F |
| Temperature (°F) - soil | | | | 71° F | 68° F |
| Relative Humidity (%) | | | 38 | 56 | 53 |

**Data or endpoints collected/recorded:** Mounds were evaluated for activity and mortality at 1, 2, 3, 4, 5, 10, 15, 20, and 30 minutes after application. All mounds were re-evaluated at 40 days after treatment. Product effectiveness was evaluated using an Efficacy Rubric rating scale as follows:

0 - Complete ant /mound control; no activity or movement observed; all visible ants in the treated area dead.
1 - Acceptable control; ant activity and movement observed; < 10% of ants in treated area alive but all exhibiting signs of morbidity and/or are moribund; 90%+ of ants are dead.
2 - Significant reduction in ant activity and movement observed; < 30% of ants in treated area alive but all exhibiting signs of morbidity and/or are moribund; 70-90% of ants are dead.
3 - Moderate reduction in ant activity and movement; ~50% of ants in treated area exhibiting signs of mortality or morbidity; 50-70% of ants are dead.
4 - Minimal reduction in ant activity and movement; < 30% of all ants in treated area exhibit signs of mortality or morbidity.
5 - No visible reduction in ant activity and movement; < 10% of all ants in treated area exhibit signs of mortality or morbidity.

Assessments were terminated after two successive 0 ratings. Final data on mound activity was taken on November 24, 2014.

**Data analysis:** Mean visual rating of fire ant mounds; Tukey's Studentized Range Test, P>0.05

## RESULTS

Mean visual rating of fire ant mount treatments within the first 30 minutes are presented in Table 1 and Table 2 presents the results 40 days post application.

Table 1: Mean visual rating of fire ant mound treatments. Values are defined by the rubric stated above, < 1 ~ 90% control. Values followed by a different letter are statistically significant (Tukey's Studentized Range Test, P>0.05).

| Treatment | Evaluation Time in Minutes | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 10 | 15 | 20 | 30 |
| Water | 5.00 a | 5.00 a | 5.00 a | 5.00 a | 5.00 a | 5.00 a | 5.00 a | 5.00 a | 5.00 a |
| Blank DG Lite 150 Carrier | 5.00 a | 5.00 a | 5.00 a | 5.00 a | 5.00 a | 5.00 a | 5.00 a | 5.00 a | 5.00 a |
| Ortho MAX Fire Ant Killer Broadcast Granules (0.2% bifenthrin) | 4.20 b | 4.00 b | 3.57 b | 3.10 b | 2.63 b | 1.63 b | 0.73 b | 0.43 b | 0.10 b |

Table 2: Number of mounds alive 40 days post application.

| Treatment | Replication | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| Water | 9, 1 moved, found | NA | NA |
| Blank DG Lite 150 Carrier | 8, 2 moved or dead, not found | 9, 1 moved, found | 9, 1 moved, found |
| Ortho MAX Fire Ant Killer Broadcast Granules (0.2% bifenthrin) | 0 | 0 | 0 |

The Ortho Fire Ant Killer (standard) and the Ortho Test product both worked very fast. At the 1 minute rating period, both had significantly less activity than the control mound or the DG Lite 150 (P=0.003). Mound control was > than 90% by 15 minutes. No live mounds in the treated plots were found on November 24.

## Study Author's Conclusions

The study authors concluded that Ortho Max Fire Ant Killer Broadcast Granules (0.2% bifenthrin) achieved excellent control of fire ant mounds in a short period of time. Acceptable control was achieved within 15 minutes and was maintained for 40 days post application. In addition, the authors stated that given these results from Alabama and previously submitted and approved data from Texas and Georgia (MRID 48387492), they made the following claims for a formula containing 0.2% bifenthrin: kills fire ants fast; kills fire ants in minutes; and kills fire ants in 15 minutes.

## Reviewer's Conclusions

This was a well-conducted study. Both the control and blank DG Lite 150 carrier received efficacy rubric ratings of 5 at all evaluation times, indicating no visible reduction in ant activity and movement and <10% of all ants exhibited signs of mortality or morbidity. Control of fire ant mounds was achieved within 15 minutes following application with >90% mortality. Efficacy was statistically significant from the untreated control, and carrier only treatment within 1 minute.

## Reviewer's Recommendations

Acceptable. This study supports the following claims for speed of action for mound treatments against fire ants: starts killing fire ants in minutes, kills fire ants in 15 minutes.